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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,104	09/04/2001	Sergey Porotsky	POROTSKY=1	1746

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EXAMINER	
PWU, JEFFREY C	

ART UNIT	PAPER NUMBER
2143	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/944,104	POROTSKY, SERGEY	
	Examiner	Art Unit	
	Jeffrey Pwu	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/19/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Regarding claim 1, the specification lacks written description in the normalizing step, "normalizing the D-parameter CDV by symbolically modifying the ATM network", it is unclear and lacks written description in the step of how to symbolically modify the ATM network.

4. In claim 1, the specification lacks written description in the limitation "constructing a link cost equation comprising a first member reflecting influence of the D-parameter MaxCTD on the cost, and a second member reflecting influence of the group of non-D parameters on the cost, the members being taken with respective relative importance weights"; it is unclear and lacks written description on how to construct a link cost equation and it is also unclear how are the members being taken with respective relative importance weights.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 recites the limitation "the D-parameter". There is insufficient antecedent basis for this limitation in the claim.

7. Claim 1 recites the limitation "said equation". There is insufficient antecedent basis for this limitation in the claim.

8. Regarding claim 11, the phrase "could substantially", in the limitation "selecting a value of minCDV such, that values of CDV parameter of the network links could substantially be represented as respective k-fold multiples of said minCDV, where k is integer", renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention.

9. Claim 12 recites the limitation "said equation subroutine". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-12 are rejected under 35 U.S.C. 102(e) as being unpatent by Kataria et al. (U.S. 6,687,229).

Kataria et al. disclose claims :

1. A method for selecting an optimal path in an ATM network having a plurality of links where, for each of the links, Link State Parameters are defined including a group of non-D parameters comprising at least AW, and two D-parameters being MaxCTD and CDV, the method being performed by the following steps:

receiving a user's request for selecting a path between a source point and a destination point in said network (UNI, NNI),

obtaining, from the user's request, two limitations of end-to end QoS parameters of the path to be selected, one of the limitations being MaxCTD.sub.QoS and the other limitation being CDV.sub.QoS (col.2, lines 6-19, col.4, line 54-col.5, line 17),

normalizing the D-parameter CDV by symbolically modifying the ATM network so as to make CDV constant for all links of the modified network (col.5, lines 25-47),

constructing a link cost equation comprising a first member reflecting influence of the D-parameter MaxCTD on the cost, and a second member reflecting influence of the group of non-D parameters on the cost, the members being taken with respective relative importance weights (col.5, lines 25-47; col.7, line 48-col.8, line 15),

based on said equation, calculating links' costs of the modified network, for one or more values of a ratio between the relative importance weight of the first member and that of the second member, and forming a date base of link costs for each of said one or more ratio values (col.7, line 48-col.8, line 15),

applying a shortest path algorithm to each of the formed data bases to determine one or more conditional paths for the respective one or more data bases, said algorithm being capable of

selecting a minimal cost path among paths limited by a given number of links to satisfy said limitation CDV.sub.QoS (figs. 1A & 1B);

calculating one or more cumulative values MaxCTD.sub.cum of the D-parameter MaxCTD for said respective one or more determined conditional paths (col.8, lines 3-65), and

judging about the optimal path, based on comparing said one or more cumulative values MaxCTD.sub.cum with the limitation MaxCTD.sub.QoS. (col.9, line 53-col.10, line 54).

2. The method according to claim 1, wherein for normalizing the D-parameter CDV, the following steps are performed: selecting a value of minCDV such, that values of CDV parameter of the network links could substantially be represented as respective k-fold multiples of said minCDV, where k is integer; building a modified network by symbolically replacing each of the links, having CDV value of k*minCDV where k>1, with "k" fictitious component links each having the CDV value equal to said minCDV so, that the CDV value of each replaced link be equal to a cumulative value of corresponding parameter values of the "k" fictitious component links; assigning to said "k" fictitious links values of remaining link state parameters in a manner providing equivalence of said "k" links to the replaced link from the point of each of the link state parameters (col.9, line 25-col,12, line 16).

3. The method according to claim 1, wherein the step of constructing the link cost equation comprises defining a relative importance weight of the member associated with said D-parameter as R, and a relative importance weight of the member associated with the non-D parameters as (1-R) (see fig.5; administrative weights and link weights of claim 1)

4. The method according to claim 1, wherein the step of calculating links' costs of the modified network further comprises: sequentially selecting one or more R values in the range 0.ltoreq.R.ltoreq.1 and calculating for each of them link costs of all the links of the modified network using said link cost equation, and forming a data base of link costs for each of said one or more R values (method steps 56-59 of fig.3 and steps 106-109 of fig. 6).

5. The method according to claim 1, wherein the step of applying a shortest path algorithm to each of the formed data bases comprises: applying a Bellman-Ford-type algorithm to each of the data bases, for defining said conditional shortest path between the source point and the destination point, while limiting a number of links in said path to H=CDV.sub.QoS/minCDV, thereby obtaining the conditional shortest path both having a minimal sum of the cost values of links forming said path, and satisfying the end-to-end limitation CDV.sub.QoS (col.2, lines 26-59).

6. The method according to claim 1, wherein the step of calculating the cumulative value MaxCTD.sub.cum of the D-parameter MaxCTD for each of said conditional shortest paths comprises summing MaxCTD values of the links forming said path (col.4, line54-col.5, line 11).

7. The method according to claim 1, wherein the judgement about the optimal path is performed by comparing said one or more cumulative values MaxCTD.sub.cum with the limitation MaxCTD.sub.QoS, checking whether there exists a particular value R* of the relative

importance weight R at which the determined conditional shortest path has the cumulative value MaxCTD.sub.cum equal to, or smaller but substantially close to said MaxCTD.sub.QoS limitation, if yes, the conditional shortest path determined for said R* is considered the optimal path, if no, the optimal path does not exist for said limitations (step 52, of fig.3).

8. The method according to claim 3, comprising choosing an initial value of R in the range 0R<1, thereby selecting a ratio between said relative importance weights; determining the cumulative value MaxCTD.sub.cum of the conditional shortest path for the selected ratio, if the cumulative value MaxCTD.sub.cum does not exceed the required limitation Max.sub.QoS, decreasing the selected value of R within said range, if the cumulative value MaxCTD.sub.cum exceeds the required limitation MaxCTD.sub.QoS, increasing the selected value of R within said range, repeating the step of deter said MaxCTD.sub.cum up to either obtaining, at said particular value R*, the conditional path being said optional path, or concluding that the optimal path does not exist (col.4, line54-col.5, line 11).

9. The method according to claim 3, wherein values of R are selected in the following order: selecting R=0; if the cumulative value MaxCTD.sub.cum does not exceed the required limitation MaxCTD.sub.QoS, considering the defined conditional shortest path to be optimal, if the cumulative value MaxCTD.sub.cum exceeds the required limitation MaxCTD.sub.QoS, selecting R=1, and determining the cumulative value of MaxCTD.sub.cum for R=1; if the cumulative value MaxCTD.sub.path still exceeds the required maxCTD.sub.path, the optimal path does not exist; if the cumulative value MaxCTD.sub.cum for R=1 does not exceed the required limitation

MaxCTD.sub.QoS, selecting a number of R values in the range 0<R<1, up to obtaining, at a particular value R*, the cumulative value MaxCTD.sub.cum equal to, or smaller but substantially close to said required maxCTD.sub.QoS parameter, thereby considering the conditional shortest path defined for said R* to be the optimal path (steps 51-59 of fig.3).

10. The method according to claim 1, wherein said values of a ratio are selected by applying a method of secants to a function 3 MaxCTD cum = f (R) ,wherein said function being a non-increasing monotonous function (fig. 4A, 61-71).

11. A method for optimized path selection in an ATM network having a plurality of links where, for each of the links, Link State Parameters are defined including a group of non-D parameters comprising at least AW, and including two D-parameters MaxCTD and CDV, the method comprises steps of: obtaining, from a user's request for selecting a path between a source point and a destination point in said network, two limitations of end-to end QoS parameters of the path to be selected, one of the limitations being MaxCTD.sub.QoS and the other limitation being CDV.sub.QoS, selecting a value of minCDV such, that values of CDV parameter of the network links could substantially be represented as respective k-fold multiples of said minCDV, where k is integer; building a symbolic modified network from said network by symbolically replacing each of the links, having CDV value of k*minCDV where k>1, with "k" fictitious component links each having the CDV value equal to said minCDV so, that the CDV value of each replaced link be equal to a cumulative value of corresponding parameter values of the "k" fictitious component links; assigning to said "k" fictitious links values of remaining link state parameters

in a manner providing equivalence of said "k" links to the replaced link from the point of each of the Link State Parameters; defining an importance weight for the D-parameters as R, and that for the non-D parameters as (1-R); sequentially selecting one or more R values in the range 0.ltoreq.R.ltoreq.1 and determining for each of them a cumulative value MaxCTD.sub.cum of a conditional shortest path in order to obtain, at a particular value R* of the importance weight R, the cumulative value MaxCTD.sub.cum equal to, or smaller but substantially close to said MaxCTD.sub.QoS limitation; wherein the step of determining the cumulative value MaxCTD.sub.cum of the conditional shortest path comprises, for each selected value of R: calculating a cost for each link of said modified network by using a weighed equation comprising a first member, with importance weight R, reflecting influence of the D-parameter MaxCTD on the cost, and a second member with importance weight (1-R), reflecting influence of said group of the non-D parameters on the cost; applying a Bellman-Ford-type algorithm to the modified network represented by a plurality of its links' costs, for defining said conditional shortest path between the source point and the destination point, while limiting a number of links in said path to H=CDV.sub.QoS/minCDV, thereby obtaining the conditional shortest path both having a minimal sum of the cost values of links forming said path, and satisfying the end-to-end limitation CDV.sub.QoS; calculating said cumulative value MaxCTD.sub.cum of the conditional shortest path, by summing maxCTD values of the link forming said path; if said particular value R* exists, considering the corresponding to it said conditional shortest path to be the optimal path (col.2, lines 6-19, col.4, line 54-col.5, line 17; col.5, lines 25-47; col.5, lines 25-47; col.7, line 48-col.8, line 15; col.7, line 48-col.8, line 15; figs. 1A & 1B; col.8, lines 3-65; col.9, line 53-col.10, line 54).

12. A computer software product for selecting an optimal path in an ATM network having a plurality of links where, for each of the links, Link State Parameters are defined including a group of non-D parameters comprising at least AW, and two D-parameters being MaxCTD and CDV, and said ATM network being represented in the form of a network database; the product comprising a computer-readable medium in which program instructions are stored, which instructions, when read by a computer, cause the, computer to: obtain, from a user's request on selecting a path between a source point and a destination point in said network, two limitations of end-to end QoS parameters of the path to be selected, one of the limitations being MaxCTD.sub.QoS and the other limitation being CDV.sub.QoS, normalize tie D-parameter CDV by modifying the ATM network so as to make CDV constant for all links of the modified network, thereby forming a modified network database; activate a subroutine of a link cost equation comprising a first member reflecting influence of the D-parameter MaxCTD on the cost, and a second member reflecting influence of the group of non-D parameters on the cost, the members being taken with respective relative importance weights, using said equation subroutine, calculate links' costs of the modified network, for one or more values of a ratio between the relative importance weight of the first member and that of the second member, and form a data base of link costs (cost DB) for each of said one or more ratio values; apply a subroutine of a shortest path algorithm to each of the formed cost DBs to determine one or more conditional paths for said one or more cost DBs respectively, said algorithm being capable of selecting a minimal cost path among paths limited by a given number of links to satisfy said limitation CDV.sub.QoS; calculate one or more cumulative values MaxCTD.sub.cum of the D-parameter MaxCTD for said respective one or more determined conditional paths, and judge

about the optimal path, based on comparing said one or more cumulative values MaxCTD.sub.cum with the limitation MaxCTD.sub.QoS (col.2, lines 6-19, col.4, line 54-col.5, line 17; col.5, lines 25-47; col.5, lines 25-47; col.7, line 48-col.8, line 15; col.7, line 48-col.8, line 15; figs. 1A & 1B; col.8, lines 3-65; col.9, line 53-col.10, line 54).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Pwu whose telephone number is 571 272-6798. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on 571 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sunday, November 28, 2004

JEFFREY PWU
PRIMARY EXAMINER